

## Can I Count on You to Be There for Me? Individual Differences in a Knowledge Structure

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In Study 1, the authors applied the prototype methodology to identify indicators that people use to predict whether a potential partner will “be there” for them at future times of stress. Using these indicators, the authors constructed a new type of measure of individual differences, the Knowledge of Indicators (KNOWI) Scale. It assesses knowledge of indicators that lead to an expectation that a partner will be there when needed. This measure applies signal detection methods to assess each participant’s ability to discriminate good from poor indicators. Two studies showed that the KNOWI Scale predicts performance on two laboratory tasks. In Study 2, participants interacted with a confederate who described a problem revealing subtle cues that another person will not be there when needed. High-scoring participants on the KNOWI Scale recognized the cues more readily. In Study 3, participants read stories about spouses that portrayed a “secure base script.” They then read stories about the interaction of inanimate objects and judged which story best matched the human story. High-scoring participants on the KNOWI Scale made more correct matches. In Study 4, the KNOWI Scale was shown to possess convergent and discriminant validity.

*Keywords:* prototype, social knowledge, trust, attachment theory, social support

How do people predict whether a potential partner will “be there” for them at times of stress? What kind of knowledge about relationships does one use to infer that a potential partner can be counted on to be there? A person who lacks this knowledge—but desires a partner who will be there—would seem to be seriously handicapped in selecting a long-term partner.

This article treats this knowledge as a set of indicators—cues that most people use to predict a potential partner’s future behavior. From these indicators (which are rather specific and concrete), we assume that the person makes a variety of more abstract inferences about the potential partner (e.g., his or her motives, abilities, dispositions)—and then uses those inferences to predict whether that partner will consistently be there in the future. In the

present article, we empirically identify the indicators that people commonly use to make such predictions.

Why is this knowledge important? Everyone turns to others in times of stress (Cutrona, 1986), and a voluminous literature has empirically demonstrated the benefits of social support (e.g., S. Cohen & Syme, 1985). The many far-reaching benefits include advantages to a person’s health and psychological well-being. However, the literature does not clarify the mechanisms by which supportive partners are identified and selected. Nor does it highlight important individual differences among people in possessing the knowledge needed to select supportive partners (for an exception, see Collins, Cooper, Albino, & Allard, 2002). This research investigates both of these questions: Not only does it identify the indicators that comprise the knowledge; it also examines differences among people in their knowledge.

The prototype is one way to operationalize a knowledge structure, so we adapted the prototype methodology to discover and describe these indicators, thereby exposing the knowledge. Then we constructed a new type of measure to assess each participant’s individual knowledge. Our measure shows that people possess the knowledge to very different degrees. The studies in this article also demonstrate the predictive value of this individual difference. To explain why we consider the knowledge to be so important, we begin by reviewing the theoretical role of a partner’s “being there” when needed.

### Background

What do people mean when they say that a friend “is always there for me”? The phrase “to be there for [someone]” often

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appears in everyday language; it also appears in dictionaries, including Cambridge Dictionaries Online (2007; “to be available to provide help and support for someone”), Webster’s New Millennium Dictionary of English (2003–2007; “to be available to help or support someone in a difficult circumstance”), and Wiktionary (2005; “to be available to provide comfort and support for someone, especially in a period of difficulty”). Terms such as *available*, *supportive*, *dependable*, and *responsive* are often used when describing individuals whom one can trust in this way, and a number of psychological theories that focus on this construct have arisen. For example, attachment theory is concerned with the universal need in all people to turn to others for comfort and support at times of stress (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1979). The following section examines relevant theories that concern the construct. In this article, we shall call the construct “being there.”

### Relevant Psychological Theories

According to Erikson (1950), the earliest developmental challenge for human infants is to develop a sense of trust in other people: The infant needs to know that caregivers will be there to take care of the infant’s basic needs. Bowlby’s attachment theory (Bowlby, 1979; see also Ainsworth et al., 1978) elaborated on this theme. It postulated that when they feel threatened or distressed, children as well as adults seek attachment figures for protection and comfort, using the attachment figure as a *safe haven* and a *secure base*. Sarason, Shearin, Pierce, and Sarason (1987) extended the idea to the effect of social support in adulthood: “The function that social support plays in a young adult and an adult’s life is likely an extension of that played by attachment experiences in infancy” (p. 830).

According to Reis and Shaver’s (1988) model of intimacy (later modified by Reis and Patrick, 1996), a feeling of intimacy is created between two people when one person is responsive to the other person’s self-disclosure or self-expression. Partners are said to be responsive when they “attend to and react supportively to central, core defining features of the self” (Reis, Clark, & Holmes, 2004, p. 203). The term *responsive*, as used by these authors, implies *effective* responsiveness, that is, successfully detecting and providing what the partner needs. Research suggests that social support is most effective when it matches the needs of the care seeker (Horowitz et al., 2001). A responsive partner would know and provide whatever type of support is appropriate—including (when needed) noninterference, backing off, or permitting autonomy.

### Confidence That a Partner Will Be There When Needed

All of the above theories also emphasize the importance of a person’s *feeling confident* that the partner will be there when needed. According to Erikson (1950), as a result of the parents’ availability and responsiveness to the infant’s needs, the infant acquires a trusting attitude that people, in general, will be there for the infant. This expectation is then carried into subsequent relationships. Similarly, according to Bowlby (1979), “human beings of all ages are found to be at their happiest and to be able to deploy their talents to best advantage when they are confident that, standing behind them, there are one or more trusted persons who will

come to their aid should difficulties arise” (p. 103). Attachment theory postulates that the caregivers’ responsiveness (availability, sensitivity, respect for the child’s autonomy, and acceptance of his or her individuality) creates an expectation in the child (and later, in the adult) that other people with whom the person becomes intimate will be there when needed.

The social support literature and the literature on partner responsiveness also stress the importance of knowing that other people will be there for the person. In discussing the positive effects of social support, Sarason et al. (1987) wrote:

It is this feeling—that we are loved and valued, that our well-being is the concern of significant others—that is protective. Yet the main effect of these communicated feelings is not to protect the individual from possible harm *per se*, but to foster in supported individuals the feeling that they are worthwhile, capable, and valued members of a group of individuals and that the resources necessary for the pursuit and achievement of their goals are available to them. (p. 830)

According to Holmes and Rempel (1989), the belief that a partner will be there when needed is at the core of interpersonal trust between close relationship partners. Holmes and Rempel define trust as people’s “abstract positive expectation that they can count on a partner to care for them and be responsive to their needs, now and in the future” (p. 188). Thus, a person’s perception that a partner is responsive seems to be a major ingredient in the development of trust.

### Knowledge About the Indicators That a Partner Will Be There

What is the process that allows a particular person (A) to infer that a potentially intimate partner (B) will be there when needed? First, cues must exist that indicate that Person B is willing and able to respond effectively to Person A’s needs (Holmes & Rempel, 1989; Rempel, Holmes, & Zanna, 1985). Second, Person A must have the ability to recognize the significance of those cues. Brunswik’s (1956) lens model examined both of these requirements for accurate person perception—that valid cues (a) exist and (b) are used by the perceiver. The present article focuses on both aspects of the process. In particular, we have tried to identify important indicators, or cues, that most people use when they try to judge whether a potential close-relationship partner is likely to be there when needed. This collection of indicators or cues may be viewed as a knowledge structure. Theoretically, then, we reasoned that some individuals possess richer knowledge about the construct than others and therefore should be better equipped to make valid judgments of another person’s being there when needed.<sup>1</sup>

How might we identify the content of the knowledge structure? The concept of a *prototype* is frequently used by social psychologists to describe a knowledge structure (e.g., Fehr, 1988, 2004a), so one possibility would be to adapt that methodology. The method is based on procedures that Rosch (1975) pioneered to study the way people conceptualize natural categories. Using this method-

<sup>1</sup> The processes described here concern the knowledge and ability that each partner initially brings to a relationship. After a relationship has deepened, properties of the dyad as a unit may become increasingly important in determining subsequent vicissitudes of the relationship (Holmes, 2002).

ology, Fehr and others have described the connotative meaning of concepts such as love, commitment, and intimacy. More recently, Fehr (2004a) showed that the prototype methodology not only is useful in revealing the internal structure of the features of a category but can also be used to describe complex cognitive structures, such as the interaction patterns that are central to an expectation of intimacy. We used a similar method to reveal the most important indicators that lead to an expectation that a potential partner will be there when needed.

Therefore, we first adapted Fehr's procedure to derive the set of prototypic indicators that lead to an expectation that the partner will be there when needed. The indicators contained in the prototype represent the participants' "collective wisdom." As discussed later, we assume that, in general, cues identified in this way do provide the best available predictors of a partner's being there. Accordingly, the prototype served as a kind of standard for evaluating each person's knowledge.

### Individual Differences in the Knowledge

The literature on prototypes also reveals substantial variability among individuals in their judgments of each feature's prototypicality (Beck, McCauley, Segal, & Hershey, 1988; Chaplin, John, & Goldberg, 1988). This variability among individuals suggests that some people match the prototype well when they judge each indicator's prototypicality, and others do not. A person whose prototypicality ratings match that of the prototype would seem to discriminate accurately between high- and low-prototypicality items. We assume that such a person has greater knowledge about the quality of different indicators—and is therefore better able to judge whether a partner can be trusted to be there. Conversely, a person whose own judgments about the prototypicality of each indicator do not agree well with the prototype would seem to have less knowledge about the indicators—and would therefore seem to be less able to make accurate judgments.

Individual differences have not been discussed much in the prototype literature, partly because, in general, researchers have not been able to demonstrate their utility (Fehr, 1993; however, see Dunning, Perie, & Story, 1991, for an exception). In this article, we demonstrate the value of assessing individual differences in an important knowledge structure. We argue that people differ considerably when they use social cues to predict a partner's future behavior. Some people know the valid cues, whereas others do not. We need a way of assessing this type of cognitive ability if we are to understand who has the capacity to make correct inferences and predictions.

Other investigators have also attempted to measure cognitive abilities related to social situations and social behaviors. As one example, measures have been devised for assessing *emotional intelligence* (e.g., Salovey & Mayer, 1990), which includes the ability to detect correctly from another person's facial expression the emotion that that person is experiencing. A second example is the Picture Arrangement Test of the Wechsler Adult Intelligence Scale—Third Edition (WAIS—III; Wechsler, 1997), which assesses the ability to recognize familiar social scripts from simple cues. A third example is a measure of *social intelligence*, which assesses different aspects of making social inferences, such as a participant's ability to choose the best action to obtain a desired social goal (Lee, Wong, Day, Maxwell, & Thorpe, 2000).

Thus, different aspects of social behavior seem to depend on specific types of knowledge (cognitive ability) needed for interpreting the social, emotional, or motivational meaning of a person's behavior. Although such abilities may be associated with some personality traits—for example, extraverts may have abilities that introverts generally lack—cognitive ability is conceptually different from a personality trait and is assessed quite differently. This research concerns the assessment of a cognitive ability. By assessing this ability (rather than a trait), we shall expose one mechanism by which people succeed (or fail) to identify potential partners who are apt to provide effective social support when needed.

To summarize, the present study reports a way to assess one type of ability, namely, the ability to recognize important indicators that a potential partner "will be there." Once the measure has been established, we shall demonstrate its predictive and convergent validity. Ultimately, the measure will expose the kind of knowledge that a person needs in order to develop relationships with supportive partners whose "being there" enhances the person's health and psychological well-being. Previous research has not explained why people differ so greatly in their ability to choose long-term partners who are apt to be there when needed. A person who does possess that knowledge, in theory, should be able to interpret aspects of another person's behavior more accurately and use that knowledge to select suitable partners. Therefore, a measure that assesses the necessary knowledge will increase our theoretical understanding of individual differences in obtaining social support.

### The Present Studies

In Study 1, we describe a new method for assessing individual differences in the availability of the knowledge of prototypic indicators that a potential partner will be there when needed. The method first identifies indicators of the relevant knowledge and then constructs a measure containing two kinds of items (corresponding to good and poor indicators). Participants were asked to judge the quality of each indicator for predicting whether a potential partner will be there when needed. Using concepts from signal detection theory, we scored each participant's responses to reveal that participant's ability to discriminate between good and poor indicators.

Next we demonstrate that poor ability (due to an apparent lack of the knowledge) manifests itself in actual social interactions. In Study 2, we describe a laboratory task used to test the hypothesis that people who are knowledgeable about the indicators are, in fact, more attuned to the absence of those cues in another person. In Study 3, we describe a task that assessed knowledge about attachment relationships and show that people with better knowledge of the indicators performed better on that laboratory task as well. Finally, in Study 4, we place the newly measured ability in a nomological network of related constructs.

### Study 1

#### *Individual Differences in the Knowledge Structure: The Knowledge of Indicators (KNOWI) Scale*

In Study 1, we created a measure to differentiate among people in their knowledge of indicators of a partner's being there when

needed. As a first step, we needed to obtain a pool of indicators that people commonly use to make this judgment. According to Broughton (1984), the prototype methodology is the best strategy for generating a pool of potential items (indicators). This method requires two large samples. The participants in one group (the “nominators”) generate the indicators, and those in the other group (the “raters”) then rate the quality of each nominated indicator (i.e., prototypicality). The mean prototypicality rating of an indicator is thought to reflect the aggregated wisdom of the group. According to Einhorn, Hogarth, and Klempner (1977); Linstone and Turoff (1975); and Rosch (1978), a large sample’s mean often provides the best available estimate of “reality”—that is, it is better than the individual judgments of most group members. Similarly, Funder and Sneed (1993) presented data supporting the validity of the wisdom of the group when predicting other people’s personality traits. Therefore, the indicators rated highest by the group (i.e., high in mean prototypicality) are thought to be very good indicators that a partner will be there when needed, whereas those rated lowest by the group are thought to be poor indicators.

Knowledgeable people probably use a wide variety of indicators, and the methods in this article were developed to expose those indicators empirically. The methods did not impose any theoretical constraints on the indicators. However, we anticipated the kinds of characteristics that may emerge. Developmental and social psychologists have already provided insight into factors that lead one partner to expect another to be there. For example, attachment theorists, writing about the caretaker–infant relationship, have demonstrated the importance of the caretaker’s availability, sensitivity, acceptance, and respect for autonomy. Other theorists have proposed similar concepts to characterize adult relationships theoretically (Feeney & Collins, 2001; Holmes & Rempel, 1989; Reis & Patrick, 1996; Schachner, Shaver, & Mikulincer, 2005). By adopting a purely empirical approach, we could compare the indicators discovered empirically with this earlier literature.

Once we obtained a pool of indicators, we used them to create the test: Participants were required to rate each indicator to tell to what extent it would increase their confidence that a potential partner would be there for them. From these ratings, we evaluated each participant’s ability to discriminate between prototypic (“good”) indicators and nonprototypic (“poor”) indicators. The greater the difference between the ratings of the two, the better that person’s ability to discriminate—and the greater we judged that person’s knowledge to be. In this way, the participant’s task was considered to be analogous to a signal detection task in which the participant had to discriminate signal (good indicators) from noise (poor indicators). In brief, we assessed participants’ knowledge by assessing their ability to make discriminations between good and poor indicators.

We also considered a simpler method of assessment, namely, examining the participant’s ratings of only the highly prototypic items. After all, the core of a concept is conveyed by its most prototypic indicators, and we wanted to assess how well each participant knew the importance of these indicators. However, we rejected this approach for two reasons: First, participants differ considerably in the way they use the response scale. If a participant assigns generally high ratings to all indicators, both good and poor, that participant would obtain a high score on the good indicators without having the ability to discriminate good from poor indicators. Second, in our view, a “knowledgeable” person, when judg-

ing potential partners, should be just as able to ignore the presence of poor indicators as to take note of good indicators. Mervis and Rosch (1981) made a similar point, namely, that successful categorization involves determining “which elements of a situation are *essential* and which *irrelevant*” (p. 103). For these reasons, the scoring method described below required participants to know the difference between good and poor indicators.

## Method

### *Identifying a Pool of Indicators*

A sample of 199 nominators generated the indicators. The sample consisted of 118 female and 81 male students at Stanford University, who participated as part of their course requirement. On average, participants were 19 years old. The sample included 87 Caucasians, 45 Asian Americans, 24 Hispanics, 24 African Americans, and 19 other. Participants were asked to provide indicators that they thought would be helpful in answering the following question about a hypothetical partner: “Can I count on this person to be there for me emotionally at difficult times when the chips are down?” Altogether, the participants generated almost 600 responses, including many repetitions of the same indicator. Adapting the procedure described by Fehr (1988), we identified 165 distinct indicators.<sup>2</sup> Of the 165 indicators, 110 had been mentioned by a single person (i.e., idiosyncratic), and the remaining 55 had been cited by 2 or more people. Two examples are “is organized and goal-oriented” (idiosyncratic) and “knows something is wrong even though I haven’t said anything” (nonidiosyncratic). We retained idiosyncratic indicators (thereby differing slightly from Fehr’s procedure) because we wanted to increase the power of our test by including a large sample of potentially poor indicators.

### *Developing the Test*

Not all indicators generated in this way would be equally good as items for a test of participants’ ability to discriminate good from poor indicators. For example, some indicators, because of their social desirability, would receive high ratings of prototypicality by all participants and therefore would not discriminate among participants. In addition, some would also be indicators of other semantically related constructs, so they are not specific to knowledge about being there for a partner (cf. Mervis & Rosch, 1981; Rosch, 1978). For example, knowledge structures concerning love and intimacy may contain indicators that overlap with those of being there for a partner. Therefore, we needed to identify the most discriminating indicators. To do so, we used the following iterative procedure.

First, we tested two preliminary samples. The participants in each sample were students in introductory psychology classes at Stanford University who participated as part of their course requirement. Sample 1 ( $N = 62$ ) included 27 men and 35 women; 25 were Caucasian, 18 Asian American, 8 Hispanic, 6 African Amer-

<sup>2</sup> First, two undergraduate research assistants independently sorted the responses into distinct idea units. Then, their two lists were compared, and disagreements were resolved by discussion among the two research assistants and Bulent Turan.

ican, and 5 other. They ranged in age from 16 to 21 years ( $M = 19.0$ ,  $SD = 1.17$ ). Sample 2 ( $N = 47$ ) included 20 men and 27 women; 18 were Caucasian, 12 Asian American, 3 Hispanic, 4 African American, and 10 other. They ranged in age from 16 to 22 ( $M = 19.1$ ,  $SD = 1.23$ ).

We wanted to start with a large pool of potential items for our test. In addition to items representing the 55 nonidiosyncratic indicators, we also added a set of idiosyncratic indicators. One reason for including idiosyncratic indicators was to provide a set of potentially poor indicators that would contrast with the best indicators. Idiosyncratic indicators were selected to be comparable in length, situational specificity, positivity, social desirability, and other similar properties. The final set contained 94 potential items.

To keep the task manageable, we divided this pool of 94 items into two sets of 45 and 49 items. One set was administered to participants in Sample 1, the other to participants in Sample 2. Participants were asked to rate each indicator to tell to what extent it would increase their confidence that a potential partner would be there for them. The verbatim instructions can be found in the Appendix.

The rating scale ranged from 1 (*would not really increase my confidence that a potential partner will be there for me*) to 8 (*would very much increase my confidence that a potential partner will be there for me*). In prototype studies, researchers typically ask participants to rate the *prototypicality* (or centrality) of each feature. However, Hassebrauck (1997) argued that the meaning of prototypicality may not be clear to participants. In his study, Hassebrauck asked participants to rate the quality of each feature as an indicator of the construct. Similarly, Fehr (2004a), in her study of interaction patterns that lead to expectations of intimacy, instructed participants to rate each interaction pattern according to "how likely it is to produce a sense of intimacy" (p. 272). In the present study, we adopted a similar approach and asked participants to rate the quality of each item as an indicator that a potential partner would be there when needed. In this article, we use the terms *prototypicality* and *quality of an indicator* interchangeably.

*Iterative procedure for identifying discriminating items.* Our goal was to assess each participant's ability to discriminate valid indicators (which knowledgeable people recognize to be superior) from invalid indicators (which knowledgeable people recognize to be inferior). To do so, we needed to know which items (valid as well as invalid indicators) discriminate best between more knowledgeable and less knowledgeable people. This issue resembles a problem posed by item response theory (Lord, 1980): How does one simultaneously estimate item characteristics (item parameters) and person characteristics (person or ability parameters)? The estimation of each of these parameters requires that one know the other parameter.

To handle this problem, we drew on Lord's (1980) suggestions and used an iterative procedure: Separately for Sample 1 and Sample 2, we began with initial estimates of the participants' ability, using the large pool of 94 high- and low-prototypicality items. From these estimates of each participant's ability, we could then determine which items best discriminated "high-ability" from "low-ability" participants. As described below, we then used an iterative procedure to revise the set of items that best discriminate between high-ability and low-ability participants. Procedural details are described next.

The first two steps (1a and 1b) assessed each participant's ability to discriminate valid from invalid indicators:

*Step 1a.* We identified the 15 items with the highest means across participants (Set H) and the 15 items with the lowest means (Set L).

*Step 1b.* We computed, for each participant, the mean rating for Set H, the mean rating for Set L, and the difference between the two ( $H - L$ ). This difference score gave us a first estimate of each participant's ability to discriminate.

The next two steps used these difference scores to estimate each item's power to discriminate among participants:

*Step 2a.* We identified the participants with the largest ( $H - L$ ) difference scores and those with the smallest ( $H - L$ ) difference scores. The highest third were called "good discriminators" and the lowest third, "poor discriminators."

*Step 2b.* We then computed, for each item, the mean rating by good discriminators, the mean rating by poor discriminators, and the difference between the two. This difference operationalizes each item's discrimination power. It resembles an *index of discrimination* used in test construction (e.g., Anastasi, 1982).

We called the 15 items that showed the greatest positive difference  $D_p$  (for "discriminating-positive") items, and the 15 items that showed the greatest negative difference  $D_n$  (for "discriminating-negative") items.

$D_p$  items constitute valid indicators: They were rated relatively higher by good discriminators than by poor discriminators.  $D_n$  items, conversely, constitute invalid indicators: They were rated relatively lower by good discriminators. Thus, the  $D_p$  items were (a) successful in discriminating among participants and (b) high in prototypicality. Knowledgeable people (good discriminators) rated these items higher. The  $D_n$  items, on the other hand, were (a) also successful in discriminating among participants, but (b) low in prototypicality. Knowledgeable people rated these items lower.

Finally, using these  $D_p$  items as the new Set H and the  $D_n$  items as the new Set L, we repeated the entire procedure until further iterations yielded the very same items for the  $D_p$  and  $D_n$  sets (i.e., until the items in each set became stable). Stability was achieved by the second iteration for the data of both Sample 1 and Sample 2.

*Construction of final form of the measure.* This procedure enabled us to choose the most discriminating items from the sets of items presented to Sample 1 and Sample 2. We made a single list ordering the items of both sets in terms of their discrimination power. Then, we chose the best 22  $D_p$  and 23  $D_n$  items that were comparable in their discrimination power. To test these 45 items on a larger sample and further reduce their number, we then administered the items to a new sample of 217 participants (Sample 3). This sample included 84 men, 126 women, and 7 who did not report their gender; all participants were students in introductory psychology classes at Stanford University. The sample included 98 Caucasians, 63 Asian Americans, 24 African Americans, 22 Hispanics, and 10 others. They ranged in age from 17 to 31 years ( $M = 19.1$ ,  $SD = 1.51$ ). Using the iterative procedure

described above on this sample's data, we obtained the best 11  $D_p$  items and the best 11  $D_n$  items. We added 19 filler items to reduce the distinctiveness of the two sets of discriminating items (valid vs. invalid indicators). The filler items were chosen randomly from the set of nondiscriminating items used with Samples 1 and 2, with the restriction that they be comparable to the  $D_p$  and the  $D_n$  items in terms of length, positivity, social desirability, and other similar properties. Although their mean ratings of prototypicality varied, none were useful in discriminating among participants. The final set of 41 items constituted the KNOWI Scale. The items of the scale, the instructions for the participants, and the rating scale can be found in the Appendix.

*Cross-Validation Sample*

In order to demonstrate that the  $D_p$  and  $D_n$  items formed distinctively different sets (as revealed by principal components and cluster analyses), we administered the KNOWI Scale to three new samples—Samples A ( $n = 149$ ), B ( $n = 103$ ), and C ( $n = 97$ ). The combined sample ( $N = 349$ ) included 107 men, 213 women, and 29 who did not report their gender; there were 178 Caucasians, 73 Asian Americans, 51 African Americans, 40 Hispanics, and 7 others. Their ages ranged from 17 to 43 years.

The mean prototypicality rating for each  $D_p$ ,  $D_n$ , and filler item was computed for the combined sample ( $N = 349$ ); these means are shown in the Appendix. The mean rating across the 41 indicators was 5.41 ( $SD = 0.90$ ). As shown in the Appendix, prototypicality ratings for all of the  $D_p$  items were above this mean, and the prototypicality ratings for all of the  $D_n$  items were below this mean. Table 1 shows the means, standard deviations, and Cronbach's alphas for the 11  $D_p$  items and the 11  $D_n$  items (for this sample as well as for the samples in Studies 2–4). As can be seen in Table 1, the means across the items for the  $D_p$  and  $D_n$  sets, respectively, were 6.29 and 4.13;  $t(348) = 30.99, p < .001$ . Thus, as expected, the  $D_p$  items were, on average, judged to be indicators of higher quality than the  $D_n$  items.

In addition, the corresponding mean prototypicality ratings for each pair of subsamples were correlated. These Pearson  $r$ s ranged from .96 to .98 for each pair of subsamples, reflecting stability in item means.

*Results*

*Statistical Properties of the KNOWI Scale*

First, we performed separate principal components analyses on the data of each of the three samples (excluding the filler items).

The results for all samples were very similar, so we then performed a principal components analysis on the combined sample ( $N = 349$ ). A scree test revealed two components with eigenvalues of 7.36 and 3.13; all other eigenvalues were less than 1.24. A varimax rotation was performed, yielding two components that corresponded, respectively, to  $D_p$  and  $D_n$  items. The loadings of the  $D_p$  items on one component ranged from .52 to .72 (none of the  $D_n$  items had a loading within this range). The loadings of the  $D_n$  items on the other component ranged from .48 to .85 (none of the  $D_p$  items had loadings within that range). Thus, the principal components analysis clearly differentiated between the  $D_p$  and  $D_n$  items.

To examine the stability of these loadings, we correlated the corresponding loadings of the 22 items obtained from each subsample. For each pair of subsamples, the loadings on the first factor showed correlations of .94, .95, and .96. The loadings for the second factor showed correlations of .84, .90, and .90. This result shows the stability of the factor structure.

We also examined the two original components provided by the unrotated solution, and we report that result as well because it highlights an uncontrolled source of variance that will be considered when we describe the scoring procedure in the following section. In the unrotated solution, it was the second component that differentiated  $D_p$  from  $D_n$  items: Every  $D_p$  item had a positive loading on this component, and every  $D_n$  item had a negative loading. The first unrotated component, on the other hand, seems to reflect a bias among respondents in their use of the rating scale (Wiggins, Steiger, & Gaelick, 1981). That is, participants used the rating scale differently—some rated all items relatively high, whereas others rated all items relatively low—so all pairs of items tended to show some degree of positive correlation. As a result, all items,  $D_p$  and  $D_n$  alike, showed a positive loading on this first component.

The  $D_p$  items were all high in prototypicality, whereas the  $D_n$  items were all low in prototypicality. Generally speaking, high-prototypicality indicators seem to be more cohesive than low-prototypicality indicators and, for that reason, seem to lead to more false recognition errors on a memory test (Fehr, 1988; Hassebrauck, 1997). We therefore hypothesized that the  $D_p$  items would display greater cohesiveness in a cluster analysis. To test this hypothesis, we performed a hierarchical cluster analysis (Everitt, 1974) by using agglomeration schedule and squared Euclidean distance to reveal the organization of  $D_p$  and  $D_n$  items. The result of this analysis is shown in Figure 1. All  $D_p$  items clustered together to form one major cluster, and all  $D_n$  items clustered

Table 1  
Descriptive Statistics for  $D_p$ ,  $D_n$ ,  $D_p - D_n$ , and  $D_p + D_n$  for Each Study

Study	N	$D_p$		$D_n$		$(D_p - D_n)$		$(D_p + D_n)$		Cronbach's $\alpha$	
		M	SD	M	SD	M	SD	M	SD	$D_p$	$D_n$
1 <sup>a</sup>	349	6.29	0.92	4.13	1.41	2.16	1.31	10.42	1.99	.86	.90
2	56	6.63	1.04	4.16	1.32	2.47	1.41	10.79	1.91	.91	.85
3	64	6.02	0.92	4.39	1.22	1.89	1.12	10.57	1.98	.89	.92
4 <sup>b</sup>	94	6.43	0.99	4.70	1.42	1.73	1.32	11.12	2.06	.87	.88

Note.  $D_p$  = discriminating-positive items;  $D_n$  = discriminating-negative items.

<sup>a</sup> Cross-validation sample.

<sup>b</sup> Attributional complexity sample.

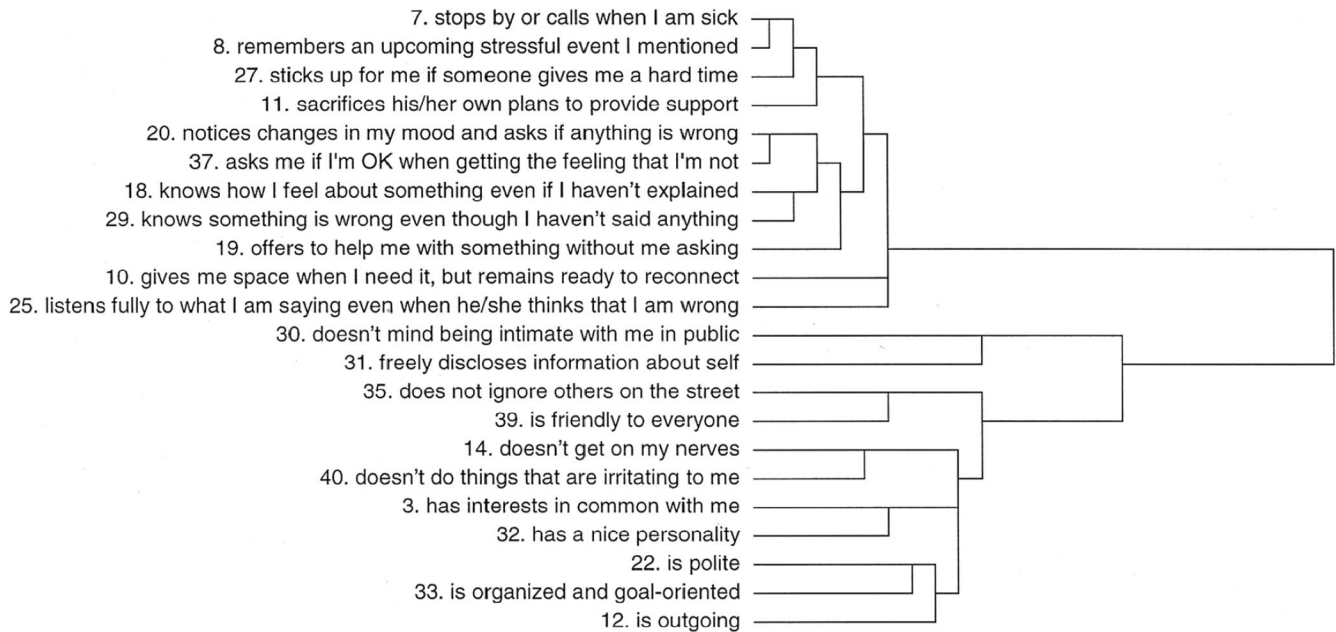


Figure 1. Results of the cluster analysis of the discriminating-positive ( $D_p$ ) and the discriminating-negative ( $D_n$ ) items of the Knowledge of Indicators (KNOWI) Scale. The top 11 items are all  $D_p$  items, and the bottom 11 items are all  $D_n$  items.

together to form a second major cluster—with no overlap between the two. As shown in Figure 1, the clusters of the  $D_p$  items (Cluster  $D_p$ ) were tighter than those of the  $D_n$  items (Cluster  $D_n$ ). This result reflects the stronger associative links among high-prototypicality items than among low-prototypicality items.

As shown in Figure 1, the  $D_p$  items included two rather tight subclusters: One (Cluster  $d_1$ ) contained four items; the other (Cluster  $d_2$ ) contained five items. These two clusters then joined each other, and that larger cluster was then joined by the two final items. The items of Cluster  $d_1$  all concerned the person's availability for providing support when a target person needs it—for example, "stops by or calls when I am sick." The items of Cluster  $d_2$  all concerned the person's sensitivity to subtle cues in the target person—for example, "notices changes in my mood and asks if anything is wrong." The remaining two items focused on respecting the target person's autonomy ("gives me space when I need it, but remains ready to reconnect") and accepting the target person's separateness ("listens fully to what I am saying even when he/she thinks that I am wrong"). It is interesting that these four categories describe the very same caregiver qualities that Ainsworth et al. (1978) and later attachment researchers (e.g., Grossman, Grossman, Spangler, Suess, & Unzner, 1985; van Ijzendoorn, 1995) have described as the basis for an infant's expectation that a caregiver will be there when needed. Likewise, Schachner et al. (2005) have hypothesized that similar elements should lead to a feeling of security in adult-adult relationships.

### Scoring the KNOWI Scale

We wanted to devise a simple scoring method for the KNOWI. A person who discriminates well between  $D_p$  and  $D_n$  items (i.e., between valid and invalid indicators) is one who rates the  $D_p$  items

substantially higher than the  $D_n$  items. One can use two different methods to assess a person's ability to discriminate. The two methods yielded similar scores (Pearson  $r = .86$ ), and in the data analyses reported later, both methods led to identical conclusions in all cases.

The first method was a Pearson  $r$  (with an  $r$ -to- $z$  transformation) between the participant's ratings of the 22 items and the corresponding group-generated prototypicality ratings (mean ratings of prototypicality for the large normative sample). Though this method is conceptually easy to understand, we preferred another method based on signal detection theory that has empirically demonstrated advantages (Paulhus, Harms, Bruce, & Lysy, 2003).

To clarify the second method, we let  $D_p$  denote a given participant's mean rating across the 11  $D_p$  items.  $D_n$  denotes the corresponding mean of the  $D_n$  items. The difference between the two means for a given individual is denoted by  $D_p - D_n$ . This difference score would reflect that person's ability to discriminate, except for one problem: As revealed by the unrotated principal components solution, people differ in their use of the rating scale; some consistently rate all items high, whereas some consistently rate all items low. For two people,  $D_p - D_n$  might equal 3, but the 3-point difference might not have the same meaning if one person rated all items relatively high and the other person rated all items relatively low.

Following the recommendation of Paulhus et al. (2003), we used the total of  $D_p$  and  $D_n$  (i.e.,  $D_p + D_n$ ) to assess the person's overall bias for high ratings; that value was then used as a covariate. The method thus consisted of a statistically corrected difference score (i.e.,  $D_p - D_n$ ) for each participant. Expressed simply, partial correlations were used to equate people statistically on the total score ( $D_p + D_n$ ). Although the development

of the scale itself may seem laborious to the reader, the scoring itself is quite simple: It requires nothing more than a sum and a difference between the ratings of valid and invalid indicators. The same method was used in analyzing the data of all studies reported in this article.<sup>3</sup>

This method is actually derived from signal-detection measures of accuracy and bias. Paulhus et al. (2003; see also Paulhus & Harms, 2004) used a procedure similar to ours for assessing intelligence. Participants were asked to rate their familiarity with particular words (including nonwords). The investigators assessed each participant's accuracy (hit rate – false alarm rate) and statistically corrected it for “criterion bias” (hit rate + false alarm rate). Then they demonstrated that this statistically corrected measure of accuracy was highly correlated with a direct measure of intelligence. It can be shown that our procedure and that of Paulhus and Harms are mathematically equivalent.<sup>4</sup>

Our way of scoring the KNOWI Scale thus provides an index of accuracy (or sensitivity), as used in signal detection theory. The concept of criterion bias, which also appears in signal detection theory, may be relevant as well in scoring the KNOWI. Criterion bias is generally considered to be a motivational variable that determines a participant's readiness to rate all stimuli as signal. We believe that criterion bias on the KNOWI is related to the respondent's motivation for relationships with a partner who is apt to be there when needed. Our research program therefore focuses on factors related to motivation as well, and that research will be described in a future article.

### *Test–Retest Reliability*

We also examined the test–retest reliability of the KNOWI by using a subset of the cross-validation sample ( $n = 116$ ) described above. These participants completed a second administration of the test 3 to 7 weeks later. Their scores on the two occasions were correlated. For the  $D_p$  items,  $r = .69$ ; for the  $D_n$  items,  $r = .67$ ; for the  $D_p - D_n$  scores,  $r = .63$ ; and for the  $D_p + D_n$  scores,  $r = .69$ . Thus, the test–retest reliability of the KNOWI Scale seemed satisfactory.

### *Discussion*

The  $D_p$  items were designed to have two important properties: (a) They are all prototypic indicators of a potential partner's being there, and (b) they discriminate between more knowledgeable and less knowledgeable participants. Therefore, an indicator's prototypicality (the first property) is a necessary but not sufficient criterion for it to qualify as a  $D_p$  item (see the Appendix). For example, the item “loves me very much,” which received a very high mean prototypicality rating, did not qualify as a  $D_p$  item.

The common theme that characterizes the  $D_p$  items seems to be that the partner “attends to my needs,” “is able to recognize my distress,” and “cares about me enough to provide support.” Kelley and Thibaut (1978) referred to this as a supportive person's active transformation of motivation from egocentric to altercentric. That is, the supportive partner seems to make the individual's needs a priority over his or her own needs.

Thus, the  $D_p$  indicators suggest that the partner has the ability and motivation to provide support. This inference then leads the person to trust the partner to be there consistently in future situa-

tions. This view is similar to that proposed by Rempel et al. (1985), namely, that trust involves a leap of faith: From available evidence, the person makes attributions about the partner's motives (and abilities), and this generalization leads to expectations that the partner will be there in unknown future situations.

To summarize, Study 1 was based on the following four assumptions: (a) A prototype provides a knowledge structure—in this case, the knowledge of indicators that a potential partner is apt to be there when needed; (b) this knowledge structure, derived from a large group, exposes that group's collective wisdom; (c) each person possesses an individual knowledge structure, but the quality of that knowledge differs from person to person; and (d) a person whose individual knowledge structure allows greater access to the group's collective wisdom would seem to be in a better position to make informed judgments about potential partners. The KNOWI Scale provides a method for assessing the quality of each person's knowledge. The next step was to demonstrate the validity of the KNOWI Scale in a laboratory setting.

## Study 2

### *Knowledge of Indicators and Thinking About a Specific Relationship*

Study 2 was designed to demonstrate that scores on the KNOWI can be used to identify people who do, in fact, make use of such indicators in everyday interactions. We hypothesized that people with better knowledge (i.e., have high scores on the KNOWI Scale) would notice relevant cues about a person's being there and apply them to make informed decisions about relationships.

### *Method*

Each participant in this study interacted with a confederate. To standardize the conditions across participants, we limited the pool of participants and confederates to include only women. In each interaction, the female confederate described a personal problem

<sup>3</sup> Also, as noted earlier, we wanted to demonstrate the advantage of using the difference ( $D_p - D_n$ ) over using  $D_p$  alone. In all subsequent studies reported in this article that test the validity of the measure, we conducted additional hierarchical regression analyses, where the main dependent variables were regressed on the mean of the  $D_p$  items as the first step. Then, the difference scores ( $D_p - D_n$ ) were added to the regression equation. In each case, the difference scores,  $D_p - D_n$ , explained statistically significant variance in the dependent variable beyond that explained by  $D_p$  alone. Similarly,  $D_p - D_n$  explained additional variance in the dependent variable in three other laboratory studies not reported in this article. According to these results, the signal detection method of scoring (using  $D_p - D_n$ ) was superior to the simple method of using the mean of the  $D_p$  items.

<sup>4</sup> We also considered using the ratio  $(D_p - D_n)/(D_p + D_n)$ . This method is similar to our preferred method—using  $D_p - D_n$ , controlling for  $D_p + D_n$ —but we preferred our approach for several reasons. For one thing, our method is consistent with other literature that has demonstrated its success (Paulhus et al., 2003). In addition, we have used both methods and have found that, in every case, our measure showed a systematically higher correlation with the external criterion of validity than did the ratio. Finally, the two indices, we have found, correlate at .7 with each other, so they seem to be measuring the same construct.

involving her female roommate. The participants were instructed to listen and react naturally to the confederate's problem. The problem description included subtle incidental details that could be taken to indicate that the roommate's boyfriend was not apt to be there for his girlfriend. The study assessed the participants' sensitivity to these incidentally mentioned details.

### *Participants*

The participants were 56 female undergraduate students enrolled in an introductory psychology course at Stanford University. Their mean age was 20.8 years ( $SD = 1.52$ ). The sample included 22 Caucasians, 15 Asian Americans, 6 Hispanics, 6 African Americans, and 7 others. Every participant had completed the KNOWI Scale as part of a questionnaire packet administered early in the term.

### *Confederates*

The confederates were two senior undergraduate women. They memorized a prepared script and then practiced their role with approximately 20 pilot participants. Each pilot session was videotaped, and the two confederates and Bulent Turan watched the videotapes to refine the script and the confederates' performance.

### *Procedure*

The participant, upon arriving at the laboratory, was introduced to her partner (the confederate). The experimenter then explained that the two of them would have a conversation together in which one, selected at random, would describe a personal problem to the other. The confederate was always selected to be the person describing the problem. She was told to think of a problem that had arisen recently in her life. The participant was then selected to be the listener. She was asked to listen and react naturally to her partner as though she were interacting with a close friend.

The problem that the confederate described concerned a recent difficulty with her roommate. The roommate had become distant and upset for reasons that the confederate did not understand. The confederate then proceeded to describe recent negative events in her roommate's life. In the course of describing the roommate's situation, she also mentioned that her roommate was in a new relationship with a boyfriend. The boyfriend was described in generally positive terms (e.g., "he is fun to be with"), but three brief vignettes that the speaker "happened" to mention all reflected violations of  $D_p$  items of the KNOWI Scale; that is, they revealed possible cues indicating that the boyfriend was not apt to be there for his girlfriend. In the first vignette ("Job"), the confederate reported an incident in which the boyfriend forgot about an important job interview that his girlfriend had mentioned and just completed. This vignette depicted the boyfriend's violation of Item 8, "remembers an upcoming stressful event I mentioned and asks me about it afterwards." In a second vignette ("Vegetarian"), the boyfriend's friends were teasing the roommate for being a vegetarian, and she became upset. The boyfriend failed to notice that she got upset and did nothing to intervene. This vignette depicted a violation of Item 20, "notices changes in my mood and asks if anything is wrong," as well as Item 27, "sticks up for me if someone gives me a hard time." In the third vignette ("Dog"), the

confederate reported that the roommate's dog had recently died, making her quite upset. That evening, when she wanted her boyfriend to stay with her, he said that he had homework to do and left, thereby violating Item 11, "sacrifices his/her own plans to provide support."

The confederate and experimenter were both blind to the participants' scores on the KNOWI Scale. The confederate adhered to the prepared script as closely as possible. She answered questions as briefly as possible and maintained a uniformly neutral acceptance of the participant's reactions. The partners were allowed to continue their discussion for a maximum of 13 min. The complete interaction was videotaped.

### *Semistructured Interview*

After the interaction was over, the experimenter led the 2 participants to separate rooms, where they completed a questionnaire about their experience. Then the experimenter interviewed the participant about her interaction with the confederate. The interviewer asked successive questions that led the participant quite naturally to describe the partner's problem, the roommate's relationship, and the boyfriend's characteristics: (a) To begin with, the interviewer asked the participant to describe the problem that the confederate had told. From the participant's point of view, the interviewer did not know what the confederate had talked about. This first question gave the participant a chance to tell the interviewer about the confederate's problem. Then the interviewer could legitimately ask about the boyfriend because the interviewer had now been informed about the roommate and her boyfriend. The next two questions asked about the confederate—(b) what she seemed to want from the interaction and (c) whether the participant was able to help. These questions served to disguise the main purpose of the interview (namely, to inquire about the boyfriend's being there). (d) Then the interviewer asked what the participant thought of the roommate's relationship with her boyfriend and what kind of a boyfriend he seemed to be. (e) The next question asked what the participant would do if she were in the roommate's shoes. Finally, to test the limits of the participant's understanding, the interviewer asked direct questions about the boyfriend's being there: (f) "Could the roommate go to the boyfriend about her problems?" and (g) "Would he be there for her?" The entire interview was audiotaped.

### *Coding of Interview*

Three coders (Bulent Turan and two research assistants), all blind to the participants' scores on the KNOWI Scale, listened to each tape recording and independently coded each interview by using the following procedure. First, each vignette ("Job," "Vegetarian," "Dog") was rated separately on a 7-point scale. In order to obtain a high score, the participant had to remember details of the vignette and cite them as possible indicators of the boyfriend's not being there. A low rating was assigned whenever a vignette was recalled without making any connection to the boyfriend's being there (e.g., citing the vignette to illustrate the boyfriend's positive qualities). Finally, the coders made one additional rating of the participant's *overall* understanding by using (a) the separate scores for the three vignettes and (b) other comments that the participant had volunteered. This final rating was used in the

analyses reported below. The lowest rating (1) indicated that a vignette was never cited as evidence of not being there—that is, vignettes were never mentioned, or a vignette was recalled either without any inference or as evidence of a desirable quality. The highest rating (7) indicated that the participant remembered all three vignettes, recognized their significance, and drew a clear inference. These ratings thus reflect the participant's sensitivity to cues related to being there. The three raters' ratings were then averaged to yield a measure of each participant's ability to apply the knowledge. The interrater reliability was good (intraclass correlation = .93).

After the semistructured interview, the participant completed the KNOWI Scale a second time. By administering the KNOWI again, we were able to correlate the results of the semistructured interview with (a) KNOWI Scale scores at the time of the laboratory session, (b) scores obtained 3–7 weeks earlier, and (c) an aggregate of the two.

### *Results and Discussion*

The global ratings of the interview ranged from 1.0 to 7.0 ( $M = 4.20$ ,  $SD = 1.65$ ). Participants with the highest scores recalled each of the three vignettes and cited them as possible evidence that the boyfriend was not apt to be there for his girlfriend. The global ratings showed substantial correlations with ratings on each of the individual vignettes: for "Job,"  $r = .72$ ; for "Vegetarian,"  $r = .76$ ; for "Dog,"  $r = .65$ .

The global interview ratings were then correlated with scores on the KNOWI Scale. Following the method described above, the interview ratings were correlated with each participant's difference score ( $D_p - D_n$ ), partialing out the sum scores ( $D_p + D_n$ ). We performed this calculation twice, by using the KNOWI data obtained (a) at the mass testing 3–7 weeks earlier and (b) at the end of the experimental session. In both cases,  $r = .41$ ,  $p < .002$ . (When the KNOWI scores from the two occasions were averaged, the value of  $r$  increased to  $.45$ ,  $p < .001$ .) These results support our hypothesis that the knowledge structure assessed by the KNOWI Scale can be used to predict whether a participant is attentive and sensitive to cues in an interaction that indicate whether another person is likely to be there when needed. As this laboratory interaction would seem to approximate a real-world dyadic interaction, the results support the hypothesis that people apply the knowledge assessed by the KNOWI Scale to actual social interactions.

In this study, the participants had no advance warning that they would be asked about the boyfriend's being there when needed, yet some were very able to provide many relevant details. This result suggests that, for them, the knowledge structure was accessible, like a process continually operating in the background that enables a person to notice particular kinds of detail and answer questions during the subsequent interview. If a person lacked the knowledge structure, of course, this background process could not occur.

The results of this study help establish the predictive utility of the KNOWI Scale. Several factors, however, may have attenuated the size of the effect. First, the participants were interacting for the first time with a partner they had never met, to discuss people they did not know at all. Given such limited information based on a brief discussion, many participants indicated afterward that they were reluctant (understandably) to draw inferences about the re-

lationship that their partner described. It is possible that this reluctance was especially true for high-scoring individuals. Second, high- and low-scoring people may have had different expectancies about supportiveness (hence, different base rates for judging its absence). For example, high-scoring participants may have had a vast store of prior positive experiences and therefore expected others to be there for them when needed. Third, it is also possible that some high-scoring people did possess the relevant knowledge about being there, but for idiosyncratic reasons (such as dysfunctional beliefs or defensive strategies), they did not (or could not) apply their knowledge. In some cases, people who possess the relevant knowledge may allow other factors (such as a partner's physical attractiveness) to upstage the partner's not being there.

### Study 3

#### *Knowledge of the Indicators and the Secure Base Script: A Laboratory Study*

The indicators all have a characteristic form: "If I (am, do, seem) X, the other person does Y." When these "if . . . then" conditionals hold, they apparently create a general expectancy that the other person will be there in times of need. Elements of the prototype, then, may be conceptualized as an integrated network of mini-scripts (Abelson, 1981), which collectively form the basis for a general expectancy about the other person. According to Abelson (1981), "The distinctive aspect of strong scripts is the relevance of learned associations between prior and consequent events" (p. 717). Bargh (1996) noted that because the events in a script regularly occur in the same order, thus creating an "if . . . then" sequence, "upon experience of one event in the chain, the next is implicitly assumed to follow, and anticipated with a high probability" (p. 179). Many researchers (e.g., Baldwin, 1992; Bretherton, Ridgeway, & Cassidy, 1990; Fehr, 2004a; Fehr & Russell, 1984; Holmes, 2002) have noted the importance of scripts—and the expectancies they induce—in defining important social knowledge structures. For example, Fehr (2004b) commented that "to know the meaning of a word such as fear is to know a script in which events unfold in a particular sequence" (p. 193). Kammrath, Mendoza-Denton, and Mischel (2005) demonstrated the relationship between information about "if . . . then" profiles available to a perceiver and the inferences the perceiver makes about a target's traits and motives. Likewise, the prototype of being there seems to provide indicators (mini-scripts) that lead to characteristic expectancies about another person.

Viewed in this way, the prototype for a partner who is apt to be there in times of need would seem to be related to another similar knowledge structure, namely, that of the secure base script, as described by attachment theorists (E. Waters & Cummings, 2000; H. S. Waters & Waters, 2006). This knowledge concerns a sequence of events in the interaction between two people in which one helps allay the distress of the other. This script contains the following "if . . . then" components (or sequence of events): (a) one person shows signs of distress; (b) the responsive partner notices that distress and (c) responds to it in a way that helps reduce it, so that (d) the once-distressed person can now return to normal activities.

The secure base script, like the mini-scripts described in the KNOWI Scale, would seem to be part of a person's general

knowledge about support and responsiveness (being there) in relationships. We were therefore curious to determine whether knowledge about one (the secure base script) is related to knowledge about the other (indicators of being there). The purpose of Study 3 was to examine this relationship in the laboratory. If a relevant script is available to a person and is activated, it should organize comprehension of event sequences (Abelson, 1981). We hypothesized that people with high scores on the KNOWI Scale have readier access to the secure base script than do people with low scores. A good way to test whether a script is available to a person is to determine whether that person can infer it from familiar situations (e.g., involving humans) and apply it (by analogy) to novel or unfamiliar situations (e.g., involving molecules, organisms, or cells).

### Method

The procedure of Study 3 was based on earlier studies of analogy performed by cognitive psychologists (e.g., Gentner, Rattermann, & Forbus, 1993). Participants read two standard referent stories about a married couple that portrayed the secure base script. Then they each read three test stories about molecules, organisms, or cells and judged which of these choices best matched the standard referent stories. One choice was a good match; the other two were not. Examples of the stories and details of the procedure are described next.

### Participants

The sample included 64 students enrolled in introductory psychology courses at Stanford University, who participated as part of their course requirement. Thirty-seven of them were female and 27 were male. On average, they were 19.4 years old ( $SD = 1.11$ ). Twenty-six were Caucasian, 15 were Asian American, 9 were Hispanic, 7 were African American, and 7 were from other ethnic backgrounds.

### Materials

*Human stories (the standard referents).* We created two stories to portray the secure base script in which one partner was there for the other. Both stories described an incident in which one spouse (the husband in one, the wife in the other) was in distress, and the other spouse noticed, responded, and successfully helped reduce that distress. Here is one example:

That night the couple had a big dinner with some friends. Then they went to bed. The wife woke up startled in the middle of the night. She was rubbing her neck. Her husband woke up, too, and said, "Are you OK?" She said, "I had this dream. I was in an interesting place. Someone grabbed me from behind and tossed me into the trunk of a car. I couldn't breathe." He wiped her forehead with a cool wash cloth and held her close until she fell back asleep.

*The test stories.* We created six sets of test stories describing an interaction between two organisms, atoms, or cells. Each set provided three choices: one "correct" story and two "incorrect" stories. The correct choice followed the secure base script—an organism was in distress, and the other, detecting that distress, successfully helped reduce it. For example, in one set, the correct choice was as follows:

The first organism's color started to fade. Organisms of this kind lose their color due to internal or external irregularities. It then emitted a signal to the second organism. The process by which these organisms emit signals is not understood by scientists. The second organism came and, together with the first organism, went back to their home site. The two organisms' outer boundaries contacted each other. They stayed in contact for a while. Then the first organism regained its natural color, which was a bright dark blue. This makes it unique since other organisms of this kind are a paler blue.

The two incorrect choices in each set did not follow the script. In some sets, the incorrect choice was composed simply of the same sentences as in the correct choice but in a scrambled order (*scrambled incorrect*). The rationale for creating incorrect choices by scrambling the order follows from Abelson's (1981) emphasis on the specific order of events in defining a script. In other sets, the incorrect choice contained novel content (*novel incorrect*). There were three sets of each type. The order of sets with scrambled and novel choices was counterbalanced across participants. An example of a scrambled incorrect choice is as follows:

The second organism came and together with the first organism they went back to their home site. The two organisms' outer boundaries contacted each other. They stayed in contact for a while. The first organism's color started to fade. Organisms of this kind lose their color due to internal or external irregularities. It then emitted a signal to the second organism. The process by which these organisms emit signals is not understood by scientists. Then the first organism regained its natural color, which was a bright dark blue. This makes it unique since other organisms of this kind are a paler blue.

In creating a novel (incorrect) choice, we took care to maintain the same length, plausibility, positivity, pseudo-scientific language, and "interpersonalness" as the correct choice. An example follows:

The nitrogen atom was overheating. This was dangerous as excessive heat could expel the electrons out of their orbital paths. Fortunately, the environment was cooling off. This helped it cool down. Once cooled, the nitrogen atom could enter into chemical reaction with other atoms. One of those was an oxygen atom that became very special for the nitrogen atom. It preferred this nitrogen atom to any other atom.

The incorrect choices contained material that is similar in content to the secure base script, but they did not include events that are specific to the secure base script in the correct order. According to research on analogy, people judge two stories to be analogous only if the higher order relational structure is similar; they disregard surface similarities such as a single common feature (Gentner et al., 1993).

### Procedure

Participants were tested individually. When they arrived at the laboratory, they were greeted and seated at a table in a comfortable room. They were asked to read the two human stories (the standard referents) about a married couple, which illustrated a secure base script. Then each participant worked on an interpolated task for 5 min. This task required the participants to describe what they had eaten for their most recent meal and then what they had eaten for each preceding meal until 5 min had passed.

Then participants were shown the first set of three test stories. Each participant was asked to decide which of the three stories in the set made the best match to the standard human stories. This procedure was repeated with six sets of test stories, so a participant's score could range from 0 errors (all correct matches) to 6 errors (all incorrect matches). Finally, all participants completed the KNOWI Scale.

### *Results and Discussion*

The number of possible errors across the six sets could range from 0 to 6. The mean number of errors across the participants was 1.63 ( $SD = 1.48$ ), indicating that the task was generally easy. For the group as a whole, the proportion of participants who made 0, 1, . . . 6 errors was .33, .16, .23, .16, .09, .03, and .00, respectively. Thus, approximately half of the participants (49%) made 0 or 1 error, whereas 51% made 2 or more errors.

Because the test stories were presented in two different orders, we first verified that the order of presentation was not a significant source of variance in accounting for the error scores. A general linear model analysis confirmed this expectation ( $p > .10$ ). The error scores were then correlated with the participants' scores on the KNOWI measure ( $D_p - D_n$ ), controlling for the sum ( $D_p + D_n$ ). The resulting partial correlation was  $-.41$ . The standardized regression coefficient ( $\beta$ ) was  $-.46$  ( $p = .001$ ).

These results were replicated with an additional sample of 94 participants, in which the possible effect of cognitive ability on the results was also examined. In this replication, we used the Vocabulary and Similarities subtests of the WAIS-III (Wechsler, 1997), eliminating early items that, according to pretest data, were too easy to discriminate among college students in our sample.<sup>5</sup> Scores on these two measures of cognitive ability were not correlated with either the KNOWI or the error scores on the story task (these correlations ranged from  $-.16$  to  $.09$ ). We entered the cognitive ability measures and the KNOWI scores into a regression equation predicting the error scores. The KNOWI was the only significant predictor;  $t(59) = -2.24$ ,  $p < .05$ . Therefore, general (academic) cognitive ability does not seem to explain any of the relationships described above.

We then repeated the regression analysis, omitting the cognitive ability measures. The partial correlation between the error scores on the story task and the participants' scores on the KNOWI Scale (controlling for the sum) was  $-.42$ . The standardized regression coefficient ( $\beta$ ) was  $-.46$ ,  $t(91) = -4.47$ ,  $p = .001$ , replicating the result reported above.

Thus, Study 3 suggests that people with greater knowledge about indicators of a partner's likelihood of being there when needed (i.e., those with high scores on the KNOWI Scale) have readier access to the secure base script. Both kinds of knowledge involve expectations based on familiar interpersonal sequences, so it would make sense that people who possess knowledge of one also possess knowledge of the other. The significant correlation between the two is consistent with the hypothesis that they both are related to a knowledge structure about a partner being there for the other.

Every item of the KNOWI Scale may be viewed as an interpersonal mini-script, a cue leading to an expectation that a partner is apt to be there when a future need arises. As a group, these mini-scripts comprise one kind of knowledge about other people.

At first glance, the laboratory tasks used in Studies 2 and 3 to validate the knowledge structure may seem very different. In Study 2, a partner described an individual who violated indicators of being there. In Study 3, the task tested knowledge about a secure base script. The respective knowledge structures may seem different because they are tied to somewhat different theoretical approaches. The first is based on a social-cognitive approach to social support, responsiveness, and trust, whereas the second is rooted in attachment theory. The two approaches do have somewhat different objectives, but they seem to have at least one point of contact, namely, that they both concern a specific partner's being there. The present data support this theoretical commonality by showing that the same type of knowledge is relevant to both constructs.

### Study 4

#### *Convergent and Discriminant Validity*

A novel feature of the KNOWI Scale is its focus on a respondent's knowledge—knowledge about indicators of a partner's being there. Therefore, the KNOWI should be part of a nomological network of variables concerning knowledge about this construct. This nomological network of variables suggested a final study of the convergent and discriminant validity of the KNOWI Scale. We expected the KNOWI to correlate with other measures of knowledge about support and responsiveness in close relationships but not with variables that simply concern properties of relationships (e.g., "How sensitive is your partner?").

To evaluate the convergent validity of the KNOWI, we included two measures related to knowledge about being there. The first assessed a person's knowledge about indicators that a parent "is apt to be there" for a child. Because this measure, like the KNOWI, concerns knowledge about being there in times of need (in this case, a parent being there for the child), we expected it to correlate positively with scores on the KNOWI.

Schachner et al. (2005) hypothesized that the processes in adulthood are similar to those in infancy: Just as a caregiver's sensitivity and responsiveness instill a sense of security in the infant (i.e., an expectation that the parent will be there when needed), a partner's sensitivity and responsiveness toward an adult should enable that adult to feel safe and secure. However, these authors have noted a lack of research on this process in adulthood: "Given that . . . expressiveness and sensitive responsiveness have been key constructs in attachment theory . . . it is surprising how few studies of attachment relationships in adulthood have focused on . . . [the caregiver's] skills and sensitivity" (Schachner et al., 2005, p. 164). By including a measure of knowledge of responsive parenting, we intended to show how similar the construct of being there is in parent-child and adult-adult close relationships.

In addition, we administered the Sharing of Hurts Scale (Stevens & L'Abate, 1989). This measure is relevant because it focuses on the link between the two components of intimacy hypothesized by

<sup>5</sup> The first 31 participants received the interpolated task used in the original study (corroborating the results of that study); the remaining 63 participants received as their interpolated task the Vocabulary and Similarities subtests of the WAIS-III (which took approximately the same amount of time to administer as the interpolated task of the original study).

Reis and Shaver (1988): personal disclosure and responsiveness. This measure was of particular interest because it contains two kinds of items: Some emphasize the knowledge that certain characteristics are important or significant for a good relationship, whereas others simply state the presence of that characteristic in a relationship. An example of the first type of item (knowledge) is "It's very important for me to know that he/she is receptive to all my feelings including the bad ones." An example of the second type (relationship characteristic) is "He/she can tell me when I have hurt him/her." Because the KNOWI scores also reflect knowledge, we hypothesized that participants' scores on the KNOWI Scale would correlate more highly with their ratings of the knowledge items of the Sharing of Hurts Scale than with their ratings of the relationship characteristic items.

The indicators contained in the KNOWI Scale are used to make causal inferences of a particular type, namely, inferences about a partner's ability and motivation to be there when needed. According to Fletcher, Danilovics, Fernandez, Peterson, and Reeder (1986), the general tendency to make causal inferences is characteristic of attributionally complex individuals. Their Attributional Complexity measure concerns a person's tendency to analyze and explain human behavior. Presumably, people with high scores on the KNOWI experience a greater sense of efficacy over this ability and are therefore more strongly motivated to make causal inferences about people. Also, the more they exercise their skill, the better they may become at making accurate inferences. We therefore expected scores on the KNOWI to be positively correlated with scores on the Attributional Complexity measure.

Three other measures were included to demonstrate the discriminant validity of the KNOWI Scale. Two of these measures do concern relationships, but they are not related to knowledge about being there, so they should not be correlated with the KNOWI Scale. One measure assessed a person's general discomfort in relating to others (Stanford Shyness Survey; Henderson & Zimbardo, 2002); the other assessed distress from interpersonal interactions (Inventory of Interpersonal Problems; Horowitz, Alden, Wiggins, & Pincus, 2000). We hypothesized that these measures would not be related to scores on the KNOWI: Even though they assess the quality of a person's interpersonal relationships, they do

not concern the specific knowledge that the KNOWI assesses. In addition, because the KNOWI assesses one type of social cognitive ability, we wanted to demonstrate that the results we obtained with the KNOWI Scale could not be ascribed to differences among the participants in their general ("academic") cognitive ability. For this reason, we administered two subscales of the WAIS-III (Wechsler, 1997), namely, the Vocabulary and Similarities subscales. These subscales were selected because they are very highly correlated with the full-scale IQ and because they are easy to administer.

## Method

### Participants

The participants in these studies were students in introductory psychology classes at Stanford University, who participated as part of their course requirement. Their demographic characteristics were very similar to those described previously. These participants included students who had completed questionnaires as part of a "Questionnaire Day" as well as students who had served in the laboratory studies. Every participant completed the KNOWI Scale as well as other questionnaires. Thus, the sample size varied across subsamples, which differed in terms of the exact questionnaires that were completed. The subsamples ranged in size from 63 to 183 participants (see Table 2).

### Measures

Six different measures were administered: three to demonstrate convergent (C) validity (Measures C1 through C3) and three others to demonstrate discriminant (D) validity (Measures D1 through D3). The three measures used to demonstrate convergent validity are described below.

*C1. Knowledge About Responsive Parenting (Elliott, Waters, & Gao, 2001; Pederson & Moran, 1995).* We created this 48-item measure by adapting two existing measures by Pederson and Moran (1995) and Elliott et al. (2001) to assess a participant's knowledge about the indicators suggesting that a parent is apt to be

Table 2  
Associations Between the KNOWI Scores and Other Measures

Measure	Correlation with KNOWI	<i>M</i>	<i>SD</i>	<i>N</i>
C1. Knowledge About Responsive Parenting <sup>a</sup>	.39**	1.87	1.15	139
C2. Sharing of Hurts—knowledge items <sup>b</sup>	.41**	6.58	0.87	98
Sharing of Hurts—nonknowledge items <sup>b</sup>	.14	5.86	0.97	98
C3. Attributional Complexity	.22*	4.89	3.82	94
D1. Stanford Shyness Survey	.01	2.60	0.54	170
D2. Inventory of Interpersonal Problems	-.03	1.23	0.49	183
D3. WAIS-III Vocabulary	-.15	11.83	3.19	63
WAIS-III Similarities	.09	11.95	2.32	63

Note. KNOWI = Knowledge of Indicators Scale; WAIS-III = Wechsler Adult Intelligence Scale—Third Edition.

<sup>a</sup> This finding was replicated in a second sample of participants (*N* = 96) who completed both tests during a mass testing. In that sample,  $r = .41, p < .005$ .

<sup>b</sup> We also replicated these results, with data obtained on two different testing occasions 3 weeks apart. The association between KNOWI and the knowledge items was  $r = .39 (p < .001)$ , and that between KNOWI and the nonknowledge items was  $r = .17 (ns)$ . The difference between these two *r*s was significant;  $t(95) = 3.29, p < .005$ . In addition, when we controlled for the nonknowledge items, the association between KNOWI and the knowledge items was unaffected.

\*  $p < .05$ . \*\*  $p < .001$ .

there for the child in times of distress. The original measures, both Q sorts containing relevant and irrelevant items, had been constructed by attachment researchers to assess whether observers judged parents to be responsive and available to their child. To adapt the measure for the purpose of assessing a participant's knowledge, we selected items that could be used to answer the question "To what extent does this behavior suggest that the parent *will be there* for the child when the child has a problem or is upset?" In the present study, the values of alpha for relevant items (valid indicators) and irrelevant items (invalid indicators) were .81 and .92, respectively. The scoring of this measure was similar to that of the KNOWI: First, we computed each participant's mean rating for the valid and the invalid indicators. Then we used the difference between these two means (controlling for the sum) as an index of the participant's knowledge of the valid indicators.

*C2. Sharing of Hurts (Stevens & L'Abate, 1989).* This 24-item measure (not including the 4-item Social Desirability subscale) was designed to assess whether the partners in a relationship tend to "share hurts" with each other. The internal consistency in the present data was high ( $\alpha = .90$ ). As noted above, we observed two kinds of items: Ten items assessed the degree to which a person recognizes (i.e., "knows") how important it is in a relationship that the partners share hurts with each other, whereas 14 other items simply noted whether the partners do, in fact, share hurts in their relationship. We computed each participant's mean separately for each set of items. (In the present data, the Pearson  $r$  between the two was .74. Despite this high correlation, however, we expected the two kinds of items to correlate differently with the KNOWI Scale.)

*C3. Attributional Complexity (Fletcher et al., 1986).* This 28-item measure requires participants to rate themselves on items such as "I don't usually bother to analyze and explain people's behavior." It is said to measure the complexity of attributions about human behavior. In the present data, the internal consistency of this measure (alpha) was .90. We used the mean of the 28-item scale as an index of each participant's attributional complexity.

The three measures used to demonstrate discriminant validity are described below.

*D1. Stanford Shyness Survey (Henderson & Zimbardo, 2002).* This 35-item self-report measure is a general measure of shyness that emphasizes participants' social performance, including their performance with strangers. It has been shown to have good test-retest reliability and internal consistency. In the present data, the alpha was .90. We used the mean of the 35-item scale as an index of shyness.

*D2. Inventory of Interpersonal Problems (Horowitz et al., 2000).* This 32-item measure assesses a person's self-reported distress from various kinds of interpersonal problems, not necessarily in close relationships. It has good internal consistency and test-retest reliability. In the present data, the alpha was .88. We used the mean of the 32 items to assess interpersonal distress.

*D3. Subscales of the WAIS-III (Wechsler, 1997).* Two verbal subscales of the WAIS-III, the Vocabulary and Similarities subscales, were selected because they are very highly correlated with the full-scale IQ (.84 and .81, respectively; Wechsler, 1997) and because they are easy to administer. Because preliminary testing showed that the early items were very easy for the participants in this sample, only the last eight items of each subscale were used. Participants' responses were scored (0, 1, or 2) according to

Wechsler's scoring instructions and then summed separately for each subscale.

## Results and Discussion

### Convergent Validity

Associations between the KNOWI Scale scores ( $D_p - D_n$ ) and other measures are presented in Table 2. As usual, the sums (i.e.,  $D_p + D_n$ ) were controlled in all correlations reported in the table. First, we expected scores on the KNOWI to be correlated with scores on the Knowledge of Responsive Parenting. (The KNOWI was administered during a mass testing at the beginning of the term, and the Knowledge of Responsive Parenting was administered in the laboratory at least 3 weeks later.) As can be seen in Table 2, there was a substantial association between the two measures ( $r = .39, p < .001$ ). This finding was replicated with another sample (see note a in Table 2).

The KNOWI and the Sharing of Hurts Scale were both administered during a mass testing. Scores on the Sharing of Hurts Scale were divided into those based on knowledge items and those based on nonknowledge items. These scores were then correlated with scores on the KNOWI—as usual, controlling for  $D_p + D_n$ . As can be seen in Table 2, the partial correlation was .41 for the knowledge items ( $p < .001$ ) but only .14 for the nonknowledge items (*ns*). The difference between these two  $r$ s was significant;  $t(95) = 4.15, p < .001$  (based on the formula proposed by J. Cohen & Cohen, 1983, concerning a test for the difference between two dependent  $r$ s). In addition, when we controlled for the nonknowledge items, the association between the KNOWI Scale and the knowledge items did not decrease ( $r = .44$ ). However, when we controlled for the knowledge items, the association between the KNOWI Scale and the nonknowledge items was reduced ( $r = -.24$ ). These findings were also replicated with another sample (see note b in Table 2).

These results indicate that scores on the KNOWI Scale are associated with those on the Sharing of Hurts measure, primarily because of items concerning the knowledge about the significance of sharing of hurts in relationships. Thus, they help establish the convergent validity of the KNOWI Scale.

As hypothesized, the KNOWI Scale had a small but significant correlation in the expected direction with the measure of attributional complexity ( $r = .22, p < .05$ ). We believe that this correlation arises because people with high scores on the KNOWI experience a greater sense of efficacy in their judgments about others and therefore are more strongly motivated to make attributions about other people's behavior. It is also possible that high scorers on the KNOWI have become better at making correct inferences about potential partners because they exercise those skills more frequently.

### Discriminant Validity

The other measures did not correlate significantly with the KNOWI Scale. The KNOWI was unrelated to measures of comfort (or distress) in social interactions. Its correlation with the Stanford Shyness Survey and that with the Inventory of Interpersonal Problems was not significant (see Table 2). Thus, the ability to discern

valid indicators of a partner's being there seems to be a specific construct that is unrelated to ease and comfort in social situations.

In addition, the two measures of cognitive ability (the Vocabulary and Similarities subtests of the WAIS-III) were also unrelated to the KNOWI Scale in the present samples. Thus, intellectual ability does not seem to account for any of the relationships reported for the samples of this research.

In brief, these results support the convergent and discriminant validity of the KNOWI Scale. Perhaps the most important result is that the KNOWI Scale correlates significantly with other measures that assess knowledge related to being there but not with measures that assess interpersonal constructs unrelated to knowledge. Therefore, as discussed below, we conceptualize the KNOWI Scale as a measure of ability.

## General Discussion

### *Summary of Results*

This project began with a simple question: What cues lead a person to expect a relationship partner to be there (i.e., to be responsive, available, and supportive) at future times of stress? The question implies a knowledge structure, but we needed to discover and describe the content of that knowledge structure. Study 1 used the prototype methodology to accomplish this goal. It identified the most salient cues. Study 1 then built upon the prototype (knowledge structure) by evaluating differences among people in their knowledge of the construct. If a person has the knowledge contained in a prototype, that knowledge should enable the person to discriminate between valid and nonvalid cues (i.e., between cues that are highly prototypic and cues that are not). Drawing upon signal detection theory, we constructed a test, the KNOWI Scale, to assess this ability to discriminate.

In Study 2, the KNOWI Scale enabled us to predict one aspect of a person's social performance in the laboratory. We created a laboratory task in which the participant interacted with a confederate-partner who described a relationship problem. The confederate's problem could be explained in terms of the boyfriend not being apt to be there for his girlfriend. Participants were then interviewed about the problem after their interaction with the confederate. People with high scores on the KNOWI Scale (i.e., those with greater knowledge) were better able to discuss the relationship problem coherently with the interviewer, by using evidence of nonresponsive behavior cited during the interaction.

Finally, Studies 3 and 4 showed that the KNOWI Scale also predicts performance in related domains of knowledge. The knowledge structure concerning being there for a partner has a conceptual overlap with the knowledge structure implied by the secure base script of attachment theorists: Both are based on expectations that a partner will be there at times of stress. Therefore, we inferred that the KNOWI Scale should enable us to predict performance on a cognitive laboratory task requiring knowledge about the secure base script. Study 3 showed that "knowledgeable" people (i.e., high scorers on the KNOWI Scale) were better able to recognize the secure base script in stories about atoms, organisms, and cells. In this way, the research integrates a goal of social psychologists (to understand support and responsiveness in relationships) with a goal of attachment theorists (to understand the role of attachment in social development).

### *Novel Aspects of This Research*

This research has several novel features. First, it emphasizes the role of knowledge in social performance: The present research concerns a kind of knowledge that people need to possess if they desire appropriate and effective support from a close friend or romantic partner. Second, the prototype methodology was used to discover and describe knowledge about indicators of being there. Third, we distinguished theoretically between the concept of a prototype (based on group norms) and the knowledge of a single individual. The method presented in this article assessed differences among people in the degree to which they possess the knowledge contained in the prototype. Fourth, to assess individual differences, we drew upon signal detection theory, evaluating each person's ability to discriminate between prototypic and nonprototypic indicators. According to Paulhus and Harms (2004; Paulhus et al., 2003), the assessment of individual differences is greatly improved if the researcher applies signal detection methods and separately measures accuracy-sensitivity and bias. Following this recommendation, we statistically controlled for bias when we assessed accuracy-sensitivity. Fifth, we showed that the resulting measure successfully predicted performance on two quite different laboratory tasks. One of the tasks involved an interview following a face-to-face interaction. The participant had to organize and remember information presented during the interaction. Finally, the results helped clarify the relationship between studies of support and responsiveness by social psychologists and studies of secure base support by developmental and social-personality psychologists.

### *Methodological Advantages of the Approach*

Focusing on the knowledge structure is particularly advantageous in assessing individual differences. One of the major problems in assessment concerns response biases in self-report measures. For example, one kind of response bias, social desirability, is a prominent feature of many questionnaire items. However, by assessing knowledge, rather than self-description, we reduce the role of social desirability: The participant is merely asked to discriminate between two types of content. We assume, therefore, that the KNOWI Scale is not strongly affected by pressures to provide a positive self-description. However, other types of response bias may still exist, such as systematic differences among participants in their use of the rating scale—a "criterion bias." Some people, for example, systematically rate all items high. By applying recent findings in the application of signal detection theory to the assessment of individual differences, our approach provides an additional control for these kinds of bias.

The KNOWI assesses one kind of social knowledge, and one can consider other knowledge-based aspects of social ability (including abilities assessed by measures of social and emotional intelligence) that may potentially contribute to the broad ability that is called *social competence*. In time, it might be possible to construct a battery of tests, analogous to that of the WAIS-III (Wechsler, 1997), that assesses representative types of knowledge that are vital to social competence. We could then examine the relationship among them (the correlation between scales of the WAIS-III range from .27 to .70) and in time achieve a better understanding of the term *social competence*.

### *Limitations of the Method*

The prototype methodology does have limitations as a method of identifying important indicators used to judge another person. For one thing, our method required nominators to produce indicators that can be expressed in words. Some indicators, however, may be nonverbal—for example, affect and other noncognitive internal cues can be difficult to articulate. Schwarz and Clore (1988), who proposed an affect-as-information theory, have provided evidence that people use feelings to make evaluative judgments. That is, feelings seem to inform people about their otherwise implicit evaluations. The prototype methodology, which focuses on knowledge structures, assumes that the indicators generated constitute a representative sample of the total set of useful indicators. Further research is needed to determine the relationship between cognitive and noncognitive cues and the relative power of each to affect people's final judgments in different situations (see, e.g., Ottati & Isbell, 1996).

The prototype methodology has another limitation. We do not know how well the indicators obtained in these studies would generalize to other cultures. Further research is needed to evaluate the similarities and differences across cultures in the indicators used to judge a partner's being there.

Another methodological issue about the selection of items concerns the situations specified by the indicators: Do the situations need to be explicit about a need for social support? The indicator "stops by or calls when I am sick" does specify a stressful situation, whereas the indicator "knows how I feel about something even if I haven't explained it explicitly" does not. Our procedure imposed no requirements of this type on the selection of items for the KNOWI.

Nor did our method control items systematically for the degree of risk implied (e.g., the risk of being rejected or criticized) when the person exposes a vulnerability. The item "remembers an upcoming stressful event I mentioned and asks me about it afterwards" implies that the person has disclosed a feeling of vulnerability and is placing the self at risk by revealing that feeling. Conversely, "knows how I feel about something even if I haven't explained it explicitly" implies no such risky self-disclosure. At a more abstract level, however, all items imply some risk. That is, people use specific indicators to make an abstract and global inference about the partner: "Does my partner have the ability and the motivation to be there when needed?" As a group, the indicators imply this higher order risk: The partner may not have the motivation or the ability to be there on a long-term basis. Only by taking this risk can a person come to trust his or her partner to reliably be there in future stressful situations. In this sense, the indicators are the building blocks in developing trust in close relationships.

### *Theoretical Issues*

In discussing the development of personality, Bowlby (1979) noted the importance of the "ability or inability of an individual . . . to recognize when a person is both trustworthy and willing to provide a base." (p. 104). Likewise, Schachner et al. (2005) highlighted the same ability in adulthood—namely, the person's ability to read cues in "a relationship partner's reactions and intentions" (p. 150), cues that lead to an "appraisal that an attachment figure

is available and responsive" (p. 152). In line with these ideas, we have assumed that knowledge (the foundation of this ability) constitutes an important ingredient of social judgments and social behavior. Therefore, we need to consider knowledge from a theoretical perspective.

A person's knowledge about indicators of a partner's future behavior must evolve from that person's history of experiences with other people. We assume that those experiences have led to a set of expectancies about interpersonal interactions (Holmes, 2000). Expectancies can often be expressed as "if . . . then" conditionals—for example, "If I am sad, P notices." Such expectancies may be regarded as mini-scripts. When a set of expectancies (mini-scripts) is confirmed, the partner is judged to be responsive and therefore likely to be there when needed. This view resembles that of Bargh (1996), who argued that a script consists of a number of "if . . . then" cognitive sequences. Following Schank and Abelson (1995), we believe that knowledge of this type arises from the person's own direct experience as well as from the person's perceptions of (and hearsay about) other people's experiences and beliefs. In brief, the knowledge about indicators that a partner will be there when needed is viewed as a composite of mini-scripts that are collected into a broader knowledge structure, which is described by the prototype. This knowledge structure then enables a person to form expectations that do or do not lead to a sense of trust. As Holmes and Rempel (1989) noted, "Expectations that form the . . . core of trust are those that focus on the partner's responsiveness to needs" (p. 188).

Even if a person does possess the knowledge, however, we must note that knowledge is not necessarily a guarantee that the person will select a partner who will be there. Sometimes another intensely pressing motive, such as a desire for sexual contact, may override the application of the knowledge. Similarly, strong affect, irrational beliefs, and fears of losing a desirable partner may all interfere with the application of the knowledge. Those factors need to be examined further.

The relationship between knowledge and the satisfaction of motives is also part of our larger theory (Horowitz, 2004; Horowitz et al., 2006). In this theory, motivational constructs are thought to vary in their breadth or level of abstraction: A *motive* (e.g., an intimacy motive) is broad and abstract—it subsumes narrower motivational constructs. A *personal striving* (e.g., a desire for a feeling of closeness with a partner who is apt to be there when needed; Emmons, 1989) or *current concern* (Klinger, 1987) is intermediate in breadth. A *goal* (e.g., a desire to have one's partner notice subtle changes in mood and comment on them) is very narrow and concrete. Many researchers have suggested that a broad motive subsumes narrower constructs, which in turn subsume still narrower constructs (Austin & Vancouver, 1996; Cantor & Kihlstrom, 1987; Cropanzano, James, & Citera, 1992; Emmons, 1989; Klinger, 1987; Little, 1983; McAdams, 1985), thereby forming a hierarchy. According to our theory, a broad motivational construct is satisfied only when a subset of narrower goals is also satisfied.

How shall we identify the goals that need to be met if the higher order motive is to be satisfied? In our view, a knowledge structure helps specify those goals. Suppose a person, trying to satisfy an intimacy motive, requires a partner who is reliably responsive to internal events such as a change in mood. The prototype of being there—with its many "if . . . then" conditionals (or indicators)—

reveals the concrete goals that need to be met if the broader motive is to be satisfied. Thus, a person's knowledge about this construct is knowledge about the very specific means by which the broader motive may be satisfied. Knowledge of these concrete goals would be particularly important if the broader motive is vitally important to the person. Future research is needed to evaluate this formulation.

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Appendix  
The KNOWI Scale

Can I Count on You?

One of the key issues in developing a romantic relationship is whether you believe that your partner will always be there for you emotionally at difficult times. Of course, you never know for sure until the chips are down. But most people are pretty good at predicting whether they have found someone they can always count on. We are interested in how people become confident that a romantic partner will always be there for them. Below, you will find some of the indicators people say they use to make such judgments. Imagine yourself developing a relationship with *someone new*.

Please rate each indicator to tell to what extent it would increase your confidence that a potential partner will be there for you.

<i>WOULD NOT really increase my confidence that a potential partner will be there for me</i>	<i>WOULD VERY MUCH increase my confidence that a potential partner will be there for me</i>	
1	2	3
4	5	6
7	8	
<i>Would it increase your confidence if a potential partner:</i>		<i>Rating<sup>a</sup></i>
1. tells me things that he/she doesn't tell to many people (F)		6.36
2. loves me very much (F)		7.07
3. has interests in common with me (D <sub>n</sub> )		4.32
4. is not inconsistent in the things he/she tells me about himself/herself (F)		5.45
5. has not betrayed me before (F)		6.18
6. says things that portray him/her as tough, but is actually a sweetheart inside (F)		3.71
7. stops by or calls when I am sick (D <sub>p</sub> )		6.56
8. remembers an upcoming stressful event I mentioned and asks me about it afterwards (D <sub>p</sub> )		6.56
9. makes an effort to stay in touch with his/her own family (F)		5.66
10. gives me space when I need it, but remains ready to reconnect (D <sub>p</sub> )		6.00
11. sacrifices his/her own plans to provide support (D <sub>p</sub> )		6.85
12. is outgoing (D <sub>n</sub> )		3.32
13. sees our relationship as destiny (F)		4.06
14. doesn't get on my nerves (D <sub>n</sub> )		3.87
15. shows understanding about life (F)		5.12
16. respects the person I am and am trying to be (F)		6.37
17. listens to what I say and responds with interest and attention (F)		6.49
18. knows how I feel about something even if I haven't explained it explicitly (D <sub>p</sub> )		6.07
19. offers to help me with something without me asking (D <sub>p</sub> )		6.26
20. notices changes in my mood and asks if anything is wrong (D <sub>p</sub> )		6.31
21. laughs at my jokes even though they are not funny (F)		3.68
22. is polite (D <sub>n</sub> )		3.62
23. is honest and truthful with me (F)		6.59
24. tells me that I am the one for him/her (F)		4.62
25. listens fully to what I am saying even when he/she thinks that I am wrong (D <sub>p</sub> )		5.89
26. has kept his/her word in prior situations (F)		6.71
27. sticks up for me if someone gives me a hard time (D <sub>p</sub> )		6.55
28. does not pass judgment on my concerns (F)		5.56
29. knows something is wrong even though I haven't said anything (D <sub>p</sub> )		6.08
30. doesn't mind being intimate with me in public (D <sub>n</sub> )		4.58
31. freely discloses information about self (D <sub>n</sub> )		5.27
32. has a nice personality (D <sub>n</sub> )		4.29
33. is organized and goal-oriented (D <sub>n</sub> )		3.64
34. sees how much I care (F)		5.12
35. does not ignore others on the street (D <sub>n</sub> )		4.25
36. makes small compromises to accommodate my likes and dislikes (F)		5.63
37. asks me if I'm OK when getting the feeling that I'm not (D <sub>p</sub> )		6.11
38. enjoys just being with me even if we don't do something special (F)		6.63
39. is friendly to everyone (D <sub>n</sub> )		4.32
40. doesn't do things that are irritating to me (D <sub>n</sub> )		3.91
41. listens to me and tries to understand my point of view (F)		6.26

*Note.* F = filler item; D<sub>n</sub> = discriminating-negative item; D<sub>p</sub> = discriminating-positive item.

<sup>a</sup> Mean prototypicality ratings.

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